

# Air Education and Training Command

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## Occupational Survey Report

### AFSC 4M0X1 AEROSPACE PHYSIOLOGY

**U.S. AIR FORCE**

Lt Larry Beer  
May 2002

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*Integrity - Service - Excellence*

## Report Documentation Page

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# Air Force Occupational Measurement SQ

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# Overview



*AETC*

- Work performed
- Survey background
- Survey sample characteristics
- Job structure
- Career ladder progression
- First-enlistment analysis
- STS and POI analysis
- Job satisfaction analysis
- Predictive retention analysis
- Summary of results



# Work Performed



AETC

- Manage aerospace physiology operation facilities
- Operate and maintain aerospace physiology devices including altitude chambers
- Instruct or observe simulated flights to altitude, and instruct in a classroom
- Train flying personnel in subjects such as aircraft pressurization, night vision, emergency first aid, oxygen equipment, and emergency escape from aircraft
- Physiology research and development, parasail instructor, and high altitude pressure suit technician

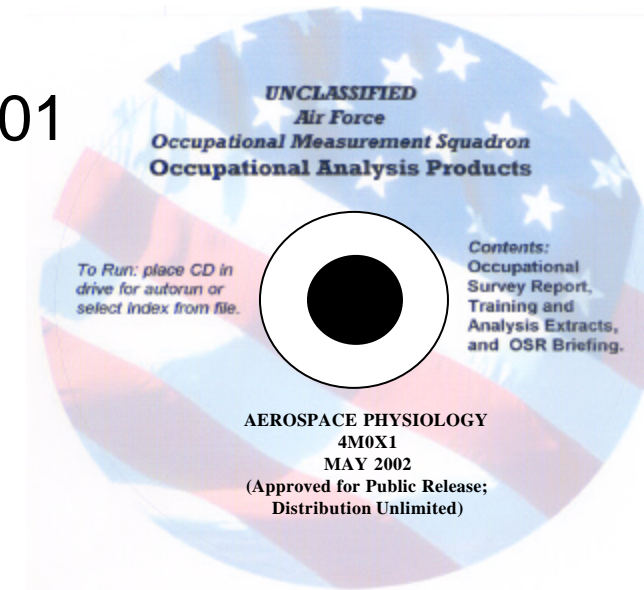


# Survey Background



AETC

- Survey initiated to obtain data to:
  - Evaluate current classification and training documents
  - Support promotion test development
- Last Occupational Survey Report (OSR) - June 1999
- Current survey data collected: Jul-Oct 2001
- Active Duty
  - 3-, 5-, 7- and 9-Skill Levels





# Current Training Program



AETC

- AFSC awarding course
  - Brooks AFB, TX
  - B3ABY4M031-001, Aerospace Physiology Apprentice Course, 8 weeks, 1 day
  - 18 Semester hours for CCAF
  - Programmed TPR

	<u>Programmed Elimination Rate</u>
FY02: 75 students	FY02: 10%
FY03: 60 students	FY03: 10%



# Survey Sample Characteristics



*AETC*

Assigned *	304
------------	-----

Surveyed	255
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Sample	168
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% of Surveyed	66
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- Average time in career field for AD: 8 yrs 11 months
- Average TAFMS: 9 yrs 10 months
- Percent of AD in first enlistment: 32%

\* Assigned as of July 01





# Skill & Paygrade Characteristics



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## Skill Level Distribution

	Assigned**	Sample
3-Level -	21%	24%
5-Level -	51%	48%
7-Level -	25%	24%
9-Level -	3%	4%

## Paygrade Distribution

	Assigned**	Sample
E-1 - E-3 -	21%	25%
E-4 -	19%	17%
E-5 -	28%	27%
E-6 -	19%	18%
E-7 -	11%	10%
E-8 -	1%	2%
E-9 -	*	1%

\* Indicates less than one percent

\*\* Assigned as of July 01



# Command Representation



AETC



Command	Assigned %*	Sample %
AETC	24	29
AMC	9	10
ACC	39	33
AFMC	17	15
USAFE	1	1
PACAF	6	7
USAF A	4	5



\* Assigned as of July 01

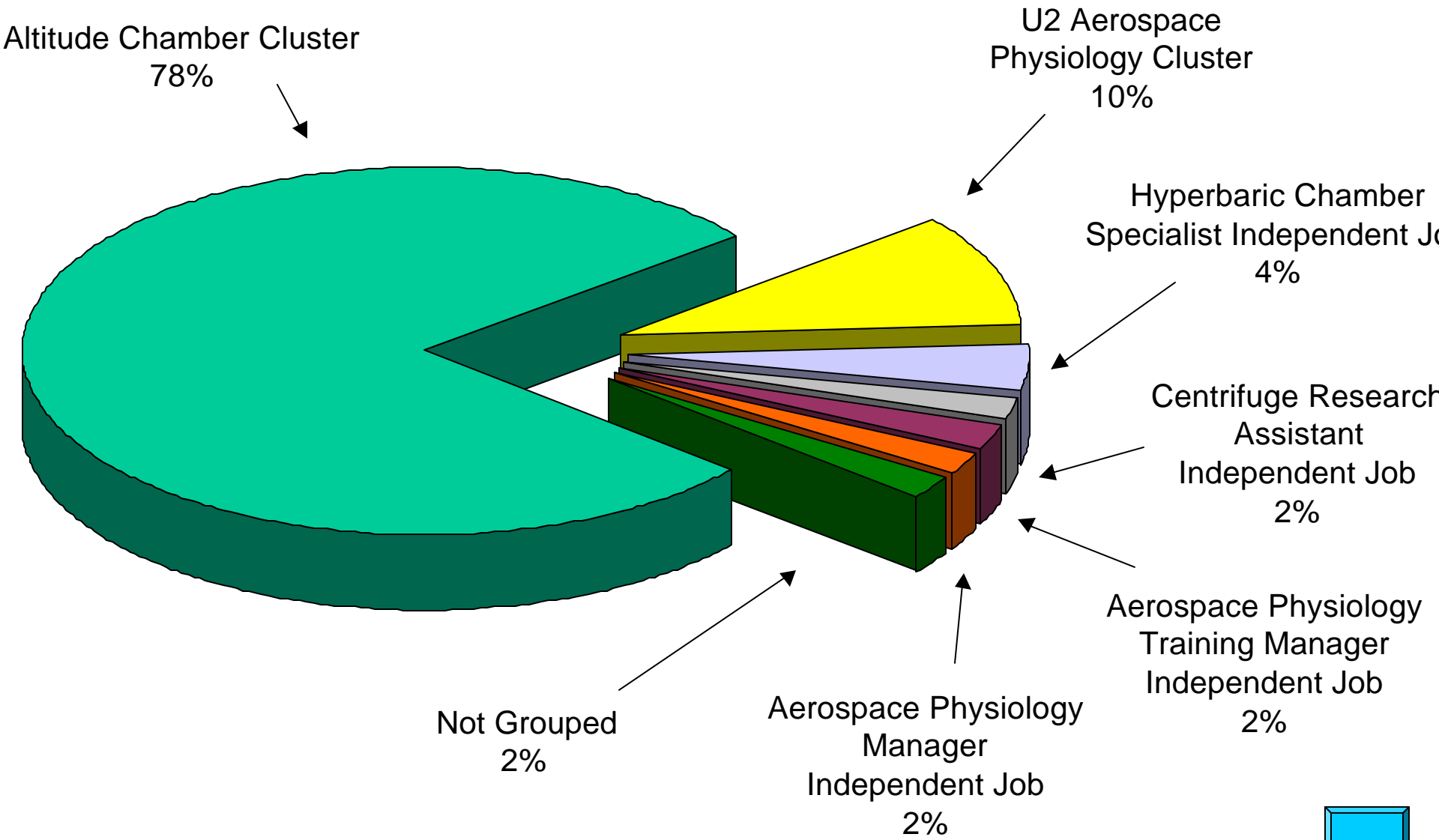


# Job Structure



AETC

Sample size: 168





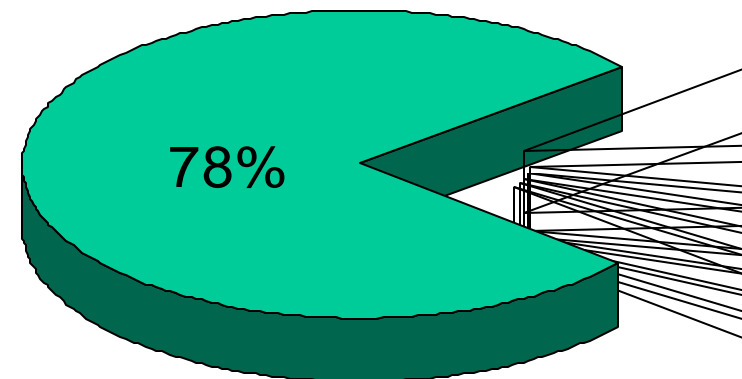
# Altitude Chamber Cluster (N=130)



AETC

- Perform Type 2, 4 and 1 chamber flights
- Perform inside observer duties during hypobaric chamber flights, other than research flights
- Perform ops and emergency procedures as crew chief and chamber operator
- Fit students with oxygen masks and flight helmets
- Conduct briefings on rapid decompression

Altitude Chamber Apprentice Job
HAAMS Job
Hypobaric Chamber Instructor/Monitor Job
Hyperbaric Chamber Specialist Job
Altitude Chamber NCOIC Job
UPT Parasail Job





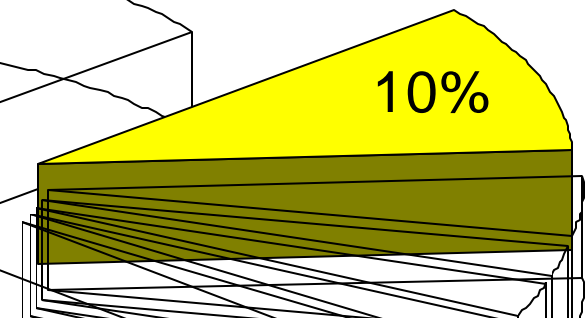
# U2 Aerospace Physiology Cluster (N=17)



AETC

- Perform launch activities, such as preflight, layout, physical, dress, integration, prior to entry, or hookup
- Perform preflight physical examinations of pressure suit occupants
- Perform high-flight recovery procedures
- Perform occupied full pressure suit integration tests
- Perform high-flight vent change over procedures
- Prepare full pressure suit for pilot dressing
- Troubleshoot full pressure suit assemblies

U2 Aerospace Physiology NCOIC Job  
U2 Aerospace Physiology Technician Job



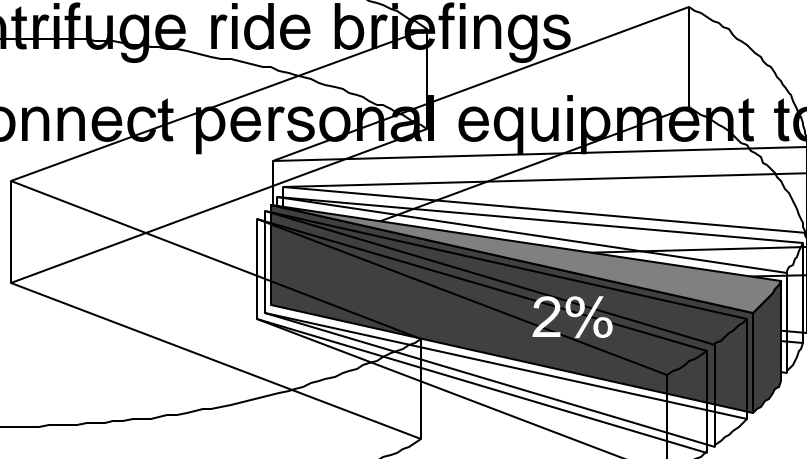
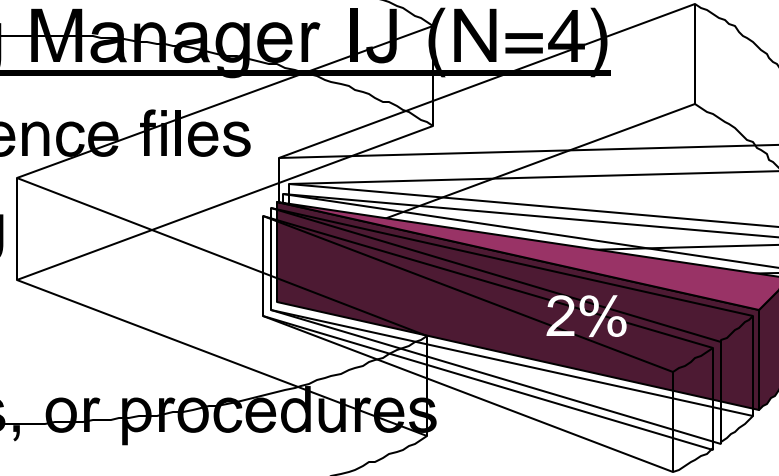


# Independent Jobs



AETC

- Aerospace Physiology Training Manager IJ (N=4)
  - Establish or maintain study reference files
  - Evaluate effectiveness of training programs, plans, or procedures
  - Develop training programs, plans, or procedures
- Centrifuge Research Assistant IJ (N=4)
  - Serve as centrifuge central observer
  - Conduct pre-centrifuge ride briefings
  - Connect or disconnect personal equipment to or from centrifuge



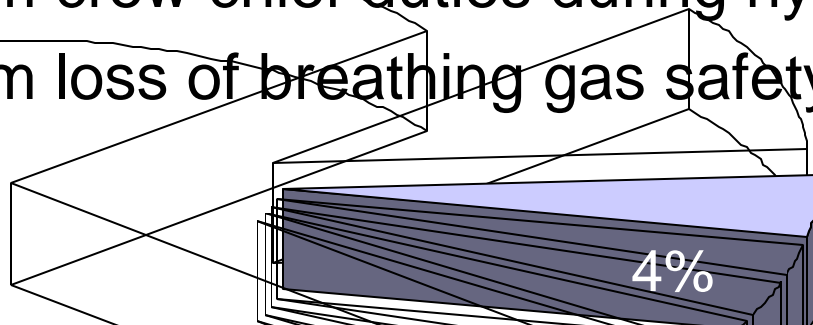
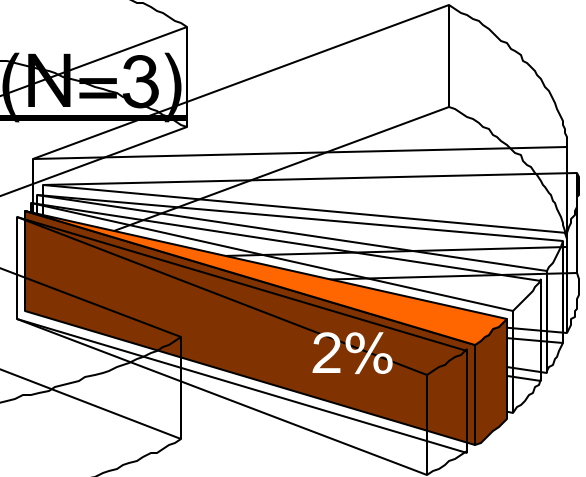


# Independent Jobs



AETC

- Aerospace Physiology Manager IJ (N=3)
  - Interpret policies, directives, or procedures for subordinates
  - Conduct staff meetings, briefings, conferences, or workshops
  - Counsel subordinates concerning personal matters
- Hyperbaric Chamber Specialist IJ (N=6)
  - Perform operator duties during hyperbaric chamber dives
  - Perform crew chief duties during hyperbaric chamber dives
  - Perform loss of breathing gas safety procedures





# Career Ladder Progression



AETC

- 3- and 5-skill-level personnel
  - Work in the most technical jobs in the career field
  - Spend most of their time on technical tasks
- 7- skill-level personnel
  - Continue to perform technical tasks
  - However, take on supervisory, training, and administrative duties







## DAFSC



	DAFSC 4M031 (N=41)	DAFSC 4M051 (N=81)	DAFSC 4M071 (N=40)	DAFSC 4M091 (N=6)
Altitude Chamber Cluster	88	72	75	100
J2 Aero Phys Cluster	2	16	8	0
Aero Phys Training Manager IJ	0	1	8	0
Centrifuge Research Assistant IJ	0	4	3	0
Aero Phys Manager IJ	0	1	5	0
Hyperbaric Chamber Specialist IJ	2	6	0	0
Not Grouped	8	0	1	0



# Career Ladder Regression

## Percent Time Spent on Duties



AETC

	DAFSC 4M031 (N=41)	DAFSC 4M051 (N=81)	DAFSC 4M071 (N=40)	DAFSC 4M091 (N=6)
Performing Hypobaric Chamber Activities	36	17	12	4
Performing Life Support Equipment Activities, Not P Suit	12	5	5	2
Performing Aero Phys Instruction or Training Activities	16	16	12	9
Performing Pressure Suit Phys Support Activities	3	12	5	*
Performing High-Altitude Airdrop Support Missions (HAAMS) Activities	2	2	2	0
Performing Aircraft Emerg Escape and Special Phys Trainer Activities	3	5	3	5
Performing Physiological Research Activities	3	2	3	2
Performing Hyperbaric Chamber Activities	5	10	3	6
Performing Parasail Activities	1	4	3	5
Performing General Admin and Tech Order Sys Activities	8	6	7	6
Performing General Supply and Equipment Activities	2	3	3	2
Performing Medical Readiness Activities	2	2	3	6
Performing Training Activities	4	7	11	10
Performing Management and Supervisory Activities	2	11	30	45

\*Indicates less than 1 percent



# First-Enlistment Job Structure



AETC

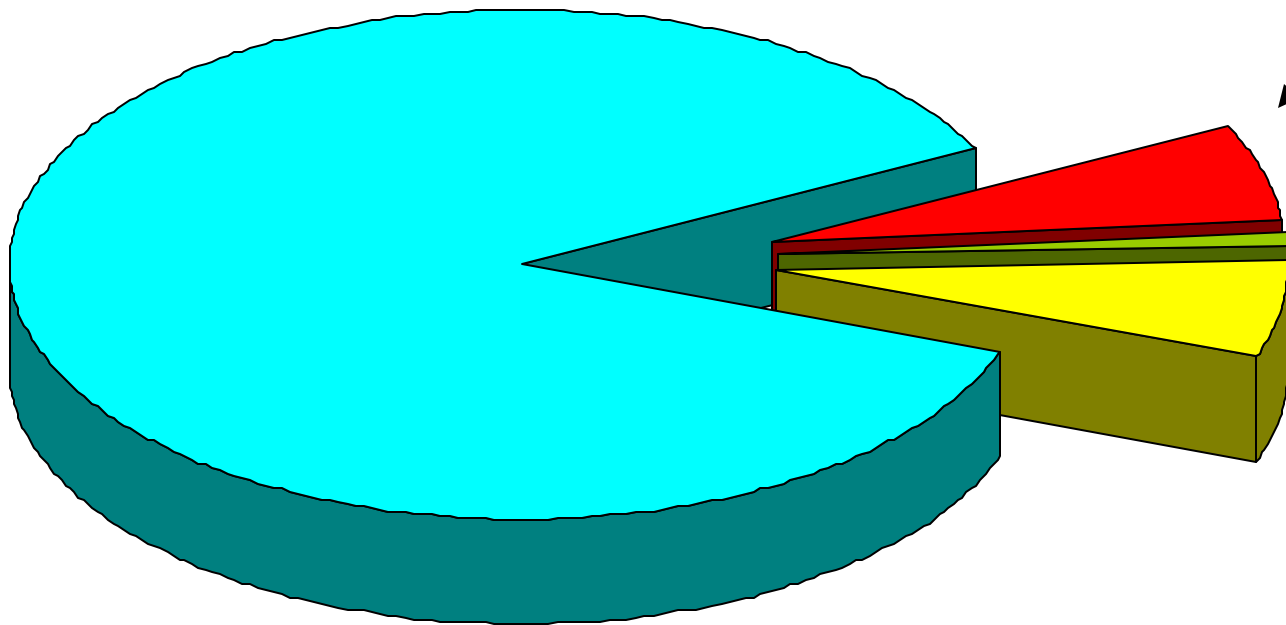
Sample size: 54

Altitude Chamber Cluster  
87%

U2 Aerospace  
Physiology Cluster  
6%

Hyperbaric Chamber  
Specialist  
Independent Job  
1%

Not Grouped  
6%





# Representative Tasks



AETC

Tasks	Percent Members Performing (N=54)
perform inside observer duties during hypobaric chamber flights, other than research flights	93
perform Type 4 chamber flights	91
perform Type 2 chamber flights	91
perform operational and emergency procedures as crew chief	89
perform Type 1 chamber flights	85
assist students with oxygen masks	85
assist students with flight helmets	83
perform operational and emergency procedures as chamber operator	81
perform operational and emergency procedures as recorder	81
connect or disconnect high pressure oxygen cylinders	80
clean flight helmets or oxygen masks	80



# First Enlistment Personnel Equipment



AETC

Equipment	Percent Members Performing (N=54)
Hypobaric Chambers	85
Vacuum Pumps	83
Oxygen Manifolds	83
Desktop Computers	78
Night Vision Trainers	56
Compressors	54
Oxygen Charging Assemblies	52
Audiovisual Equipment	48
Spatial Disorientation Trainers	44
Medical Supply Cabinets	43
Personal Protective Equipment	41



# Specialty Training Standard (STS) Analysis



*AETC*

- STS is generally supported by survey data
  - Only 5 STS items were unsupported
- Some STS items may need proficiency code review
  - Three uncoded STS items matched to JI tasks performed by more than 20 percent of members
- All technical tasks performed by 20 percent or more of members were referenced to the STS





# Unsupported STS Elements



AETC

Unit	Learning Objective	Prof Code	Percent Members <u>Performing</u>		Tng Emp	Tsk Diff	ATI
			1st Job	1st Enl			
7.1.	Spatial Disorientation Trainers	2b					
Task	F0203. Conduct instruction on use of spatial disorientation trainers		17	20	3.24	5.15	7
Task	F0218. Perform daily inspections of spatial disorientation trainers		9	9	3.21	3.87	3
7.2.1.	Perform daily inspections of vertigons	3c					
Task	F0219. Perform daily inspections of vertigons		4	6	2.07	3.66	1
19.2.6.	Perform parachute landing fall	3b					
Task	F0208. Instruct or evaluate students on parachute landing fall (PLF) platforms		17	17	3.97	5.61	11
20.3.4.	Recognize signs and symptoms, and manage the treatment of physiological reactions	3c					
Task	E0196. Observe or treat aircrew, parachutists, and other aircraft occupants for physiological effects of altitude		0	13	2.72	5.70	7
21.11.	Serve as centrifuge central observer	2b					
Task	G0262. Perform central observer duties during centrifuge operations		4	2	1.62	5.84	2
Task	G0296. Serve as centrifuge central observer		1	1	1.45	4.87	2

Mean TE Rating is 2.10, Standard Deviation is 1.32 (HIGH TE= 3.42)  
Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD= 6.00)





# Emergency Codes Requiring Review



AETC

Unit	Learning Objective	Prof Code	Percent Members Performing		Tng Emp	Tsk Diff	ATI
			1st Job	1st Enl			
7.3.	Perform practical demonstrations of night vision trainers	b					
Task	C0074. Conduct classroom instruction concerning night vision principles and problems		17	46	4.69	5.64	12
10.2.1.	Use and maintain files	a					
Task	J0400. Maintain administrative files		35	33	4.34	4.68	12
8.6.5.2	Perform operational and emergency procedures as inside observer for chamber flights	b					
Task	A0009. Perform operational and emergency procedures as chamber operator		91	81	7.28	5.41	18

Mean TE Rating is 2.10, Standard Deviation is 1.32 (HIGH TE= 3.42)  
Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD= 6.00)





# Tasks not Referenced to STS



AETC

## Examples

<u>Tasks</u>	<u>Tng</u> <u>Emp</u>	1 <sup>st</sup> Job	1 <sup>st</sup> Enl	<u>Tsk</u> <u>Diff</u>	<u>ATI</u>
		(N=23)	(N=54)		
C0078 Adjust feed dogs	5.68	69	69	4.85	18
D0102 Darn parachute sys containers	3.49	39	45	4.75	18
P0507 Inspect protective covers to determine repairability	3.07	44	44	4.67	18
V0668 Update parachute records	3.88	35	39	4.99	18

Mean TE Rating is 2.10, Standard Deviation is 1.32 (HIGH TE= 3.42)  
Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD= 6.00)



# Plan of Instruction (POI) Analysis



*AETC*

- POI is generally well-supported by survey data
  - Two learning objectives matched to JI tasks performed by less than 30 percent of members
- Tasks not referenced to any POI learning objective should be reviewed for possible inclusion in POI





# Unsupported POI Objectives



AETC

<u>Tasks</u>	<u>Tng</u> <u>Emp</u>	1 <sup>st</sup>	1 <sup>st</sup>	<u>Tsk</u> <u>Diff</u>	<u>AT</u>
		<u>Job</u> <u>(N=23)</u>	<u>Enl</u> <u>(N=54)</u>		
II.15.a.(1) Perform four parachute landing falls (PLF) from the Swing Landing Trainer F0208 Instruct students on PLF platforms	3.97	17	17	5.61	11
V.8.a.(1) Given an ISO-shelter, expand and close one side of the shelter L0463 Set up or tear down ISO-shelters	1.41	4	4	4.13	2

Mean TE Rating is 2.10, Standard Deviation is 1.32 (HIGH TE= 3.42)  
Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD= 6.00)





# Tasks not Referenced to POI



AETC

## Examples

			1 <sup>st</sup>	1 <sup>st</sup>		
		Tng	Job	Enl	Tsk	
<u>Tasks</u>		<u>Emp</u>	<u>(N=23)</u>	<u>(N=54)</u>	<u>Diff</u>	<u>ATI</u>
B0041	Maintain custom oxygen mask equipment	2.48	48	28	4.14	7
B0042	Maintain custom oxygen masks	2.66	43	37	4.05	15
C0087	Develop objectives and lessons plans	2.59	30	35	6.85	15

Mean TE Rating is 2.10, Standard Deviation is 1.32 (HIGH TE= 3.42)  
Mean TD Rating is 5.00, Standard Deviation is 1.00 (HIGH TD= 6.00)



# Job Satisfaction Indicators (4M0X1 vs. Comparative Sample)



AETC

	1-48 Months		49-96 Months		97+ Months	
	2002 4M0X1 (N=24)	Comp Sample* (N=383)	2002 4M0X1 (N=24)	Comp Sample* (N=255)	2002 4M0X1 (N=90)	Comp Sample* (N=553)
Job Interesting	87	53	92	62	86	69
Talents Well Utilized	87	74	88	77	90	83
Training Well Utilized	95	83	96	84	89	84
Sense of Accomplishment	78	59	82	60	87	66
Plan to Reenlist	57	38	75	59	68	55

Health AFSC'S surveyed in the last 12 months:

4C0X1 (Mental Health Services), 4P0X1 (Pharmacy), 4V0X1 (Optometry), and 4V0X1A (Ophthalmology)



# Job Satisfaction Indicators (Current vs. Previous Study)



AETC

	1-48 Months		49-96 Months		97+ Months	
	2002 (N=54)	1999 (N=72)	2002 (N=24)	1999 (N=51)	2002 (N=90)	1999 (N=124)
Job Interesting	87	86	92	78	86	79
Talents Well Utilized	87	83	88	94	90	85
Training Well Utilized	95	*	96	*	89	*
Sense of Accomplishment	78	75	82	76	87	76
Plan to Reenlist	57	67	75	78	68	74

\* Not included in previous survey



# Job Satisfaction Indicators (Across Specialty Jobs)



AETC

	Altitude Chamber Cluster (N=130)	U2 Aero Phys Cluster (N=17)	Aero Phys Trng Mgr Indep Job (N=4)	Centrifuge Research Assistant Indep Job (N=4)	Aero Phys Mgr Indep Job (N=3)	Hyper Chamber Specialist Indep Job (N=6)
Job Interesting	87	94	75	75	67	100
Talents Well Utilized	88	100	75	100	67	83
Training Well Utilized	95	82	75	100	67	100
Sense of Accomplishment	84	88	75	100	67	83
Plan to Reenlist	62	71	75	75	67	83



# Predictive Retention Analysis

## First-Term Airmen (N=54)



AETC

	Percent Responding	Average
<b>Planning to Reenlist (N=31)</b>		
Medical or dental care for AD member	81	2.76
Military related education/training opportunities	77	2.25
Off duty education and training opportunities	74	2.61
Pay and allowances	68	2.52
Military lifestyle	68	2.38
<b>Planning to Separate (N=23)</b>		
Military lifestyle	65	2.13
Pay and allowances	61	2.50
Civilian job opportunities	43	2.70
Recognition of efforts	39	2.44
Leadership of immediate supervisor	35	2.25

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence







# Predictive Retention Analysis

## Second-Term Airmen (N=23)



AETC

	Percent Responding	Average
<b>Planning to Reenlist (N=18)</b>		
Off duty education and training opportunities	78	2.79
Job security	67	2.92
Military lifestyle	67	2.75
Military related education/training opportunities	67	2.42
Retirement Benefits	56	2.70
<b>Planning to Separate (N=5)</b>		
Pay and allowances	80	2.75
Military lifestyle	80	1.75
Esprit de corps/ morale	60	2.33
Leadership at unit level	60	2.00
Recognition of efforts	60	1.67

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence





# Predictive Retention Analysis Career Airmen (N=61)



AETC

Planning to Reenlist (N=61)	Percent Responding	Average
Retirement benefits	75	2.74
Job security	72	2.75
Medical or dental care for AD member	69	2.29
Pay and allowances	66	2.70
Military lifestyle	61	2.41

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence





# Summary of Results



- Career ladder progression typical
  - Highly technical at 3-skill progressing to more managerial at 7-skill level and beyond
- Career ladder documents well-supported by survey data
  - STS and POI provide comprehensive coverage of work performed by career ladder
  - Review of some items warranted
- Job satisfaction indicators
  - Similar when compared to previous study
  - Higher in job interest for 2<sup>nd</sup>-term airmen, lower in reenlistment intentions for 1<sup>st</sup>-term airmen, and higher in sense of accomplishment for career airmen
  - Much higher job satisfaction ratings compared to other health service AFSCs



# Way Ahead



*AETC*

- OSR Delivery Trip is scheduled for May 02
- Utilization and Training Workshop (U&TW) is scheduled for Apr 03 at Brooks AFB
- Next SKT rewrite (major) is scheduled for Oct 02



# Questions?



AETC



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<https://www.omsq.af.mil/>

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# Back-Up Slides





# Job Survey Background



*AETC*

- Previous JI and OSR
  - JI: 4M0X1-Dec 98, Lt Osgood
  - OSR: 4M0X1-Jun 99, Lt Brazier
  - Programming Support- Ms. Guesman
- Issues from Last Post-Analysis Review
  - None



# Bases Visited during JI Development (# Interviewed)



AETC

- Brooks AFB, TX (Tech School) (5) 9 May
- Beale AFB, CA (4) 9-11 May
- Holloman AFB, NM (7) 16-18 May



# Job Structure Glossary



- **Job:** A group of similar *positions* where incumbents perform many of the same tasks and spend relatively the same amount of time performing these tasks
- **Cluster:** A series or group of related *jobs* which are distinguishable from each other on some variable (weapon system maintained, ratio of supervisory to technical tasks, etc.)
- **Independent Job:** A job that does not fall within any cluster
- **N:** Number in sample



# Career Ladder Progression



AETC

- “Typical” career ladder progression
  - **3-Skill-Level** apprentices perform a very technical job which include very few administrative/supervisory tasks
  - **5-Skill-Level** journeymen still primarily perform a technical job, but acquire a mix of administrative/supervisory tasks
  - **7-Skill-Level** managers, and above, primarily perform supervisory, managerial, and administrative tasks, with relatively few technical tasks
- “Atypical” career ladder progression
  - **7-Skill-Level** personnel are still spending a significant amount of their total job time performing technical duties, with relatively few administrative/supervisory tasks



# Training Document Analysis



AETC

- Tasks from job inventory are matched to items in the STS and POI
  - Match is usually conducted with technical school personnel
- Final product provides technical school with data indicating applicability of training documents to work performed in the field in terms of:
  - Percent members performing (PMP) from AETCI 36-2601
    - » 20% PMP for STS
    - » 30% PMP for POI
  - TE and TD ratings
- Listing of tasks not referenced to training document also provided
  - May indicate areas where training coverage is lacking





# Task Factor Definitions



- **Training Emphasis (TE):** Task list completed by senior NCOs identifying those tasks that should be emphasized for structured training of first-term airmen
- **Task Difficulty (TD):** Task list completed by senior NCOs which rates the relative difficulty of each task to learn
- **Automated Training Indicators (ATI):** Indicators derived from comparing percent performing data with TE and TD data to assist in making training decisions





# Predictive Retention Indicators



AETC

- Military lifestyle
- Pay and allowances
- Bonus or special pay
- Retirement Benefits
- Military related education/Training opportunities
- Off-duty education and training opportunities
- Medical or dental care for active duty member
- Medical or dental care for family members
- Base housing
- Base services
- Childcare needs
- Spouse's career
- Civilian job opportunities
- Equal employment opportunities
- Number of PCS moves
- Location of present assignment
- Number/Duration of TDY's or deployments
- Work schedule
- Additional duties
- Job security
- Enlisted Evaluation System
- Promotion opportunities
- Training/Experience of unit personnel
- Unit manning
- Unit resources
- Unit readiness
- Recognition of efforts
- Esprit de corps/Morale
- Leadership of immediate supervisor
- Senior Air Force leadership



# Predictive Retention Analysis

## First-Term Airmen (N=54)



AETC

	Percent Responding	Average	S.D.
<b>Planning to Reenlist (N=31)</b>			
Medical or dental care for AD member	81	2.76	0.51
Military related education/training opportunities	77	2.25	0.72
Off duty education and training opportunities	74	2.61	0.49
Pay and allowances	68	2.52	0.59
Military lifestyle	68	2.38	0.79
<b>Planning to Separate (N=23)</b>			
Military lifestyle	65	2.13	0.00
Pay and allowances	61	2.50	0.73
Civilian job opportunities	43	2.70	0.46
Recognition of efforts	39	2.44	0.50
Leadership of immediate supervisor	35	2.25	0.43

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence





# Predictive Retention Analysis

## Second-Term Airmen (N=23)



AETC

	Percent Responding	Average	S.D.
<b>Planning to Reenlist (N=18)</b>			
Off duty education and training opportunities	78	2.79	0.41
Job security	67	2.92	0.28
Military lifestyle	67	2.75	0.43
Military related education/training opportunities	67	2.42	0.64
Retirement Benefits	56	2.70	0.64
<b>Planning to Separate (N=5)</b>			
Pay and allowances	80	2.75	0.43
Military lifestyle	80	1.75	0.43
Esprit de corps/ morale	60	2.33	0.47
Leadership at unit level	60	2.00	0.82
Recognition of efforts	60	1.67	1.67

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence



# Predictive Retention Analysis Career Airmen (N=61)



AETC

Planning to Reenlist (N=61)	Percent Responding	Average	S.D.
Retirement benefits	75	2.74	0.57
Job security	72	2.75	0.53
Medical or dental care for AD member	69	2.29	0.56
Pay and allowances	66	2.70	0.75
Military lifestyle	61	2.41	0.76

Scale: 1 = slight influence, 2 = moderate influence, 3 = strong influence